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QUARTERLY PROGRESS REPORT

Project Title:	Automated Pedestrian Counter		
RFP NUMBER: 2008-06	NJDOT RESEARCH PROJECT MANAGER: Vincent Nichnadowicz		
TASK ORDER NUMBER: TO 217 / RU Acct 4-27252	PRINCIPAL INVESTIGATOR: Dr. Kaan Ozbay/Ranjit Walia		
Project Starting Date: 01/01/2008 Original Project Ending Date: 12/31/2009 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
2	Literature Search	9.04%	\$ 15,000	33.34%	\$ 5,001	100.00%	\$ 15,000
3	Task 1: Comprehensive Literature Review & Policy Analysis	12.06%	\$ 20,000	75.00%	\$ 15,000	75.00%	\$ 15,000
4	Task 2: Selection of Pedestrian Counters	4.52%	\$ 7,500	0.00%	\$ -	0.00%	\$ -
5	Task 3: Select Deployment Sites	3.32%	\$ 5,500	0.00%	\$ -	0.00%	\$ -
6	Task 4: Develop Evaluation Plan	12.42%	\$ 20,600	0.00%	\$ -	0.00%	\$ -
7	Task 5: Implement Eval	35.68%	\$ 59,192	0.00%	\$ -	0.00%	\$ -
8	Task 6: Develop Recommendations & Guidelines	17.32%	\$ 28,723	0.00%	\$ -	0.00%	\$ -
9	Task 7: Project Management, Final & Quarterly Reports	5.64%	\$ 9,361	25.00%	\$ 2,340	25.00%	\$ 2,340
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 165,876		\$ 22,341		\$ 32,340

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Project Objectives:

Objective 1: Scanning

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TEL: 732-445-0579 FAX: 732-445-3325

Automated-Pedestrian-Counter-QR-06-01-2008-FINAL



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- Step 1. Assess current state-of-the art in pedestrian sensors
- a. Conduct literature review related to the pedestrian counters
 - b. Develop and conduct interviews with a number of States
 - c. Develop Recommendations

Objective 2: PILOT STUDY

- Step 2. Develop experimental set-up
- i. In close cooperation with NJDOT, select pedestrian counters to be tested.
 - ii. In close cooperation with NJDOT, select sites where field tests will be implemented.
- Step 3. Develop an evaluation plan
- Step 4. Implement the evaluation plan
- i. Conduct field tests
 - ii. Analyze data
- Step 5. Interpret results of the field evaluation

Objective 3: SYNTHESIS

- Step 1. Develop recommendations and guidelines

Project Abstract:

NJDOT needs to collect accurate pedestrian related information in a cost effective way. According to the RFP issued by NJDOT, there are key gaps for pedestrian planning and mobility including the “*number of pedestrians using any given sidewalk, path, crosswalk, or other pedestrian facilities*”. The lack of such data is in turn clearly one of the one of the most significant barriers to the development of *safety conscious transportation plans* that includes pedestrians as well as vehicles. The same RFP states two important types of information needed for reliable decision-making:

1. better understanding of pedestrian behavior,
2. more accurate and complete inventory of pedestrian flow rates.

In the past, pedestrian count information was generally collected manually. However, since the manual collection of accurate pedestrian counts can be quite expensive and time-consuming, this approach is used sporadically and as a result does not yield comprehensive data from which to make informed policy and planning decisions. In fact, because of extensive time and labor requirements of manual data collection, which might also be relatively inaccurate, reliable pedestrian flow information is most



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of the time not available to the planners and decision makers. In addition to the lack of meaningful pedestrian flow data, other information related to the understanding of “pedestrian behavior” is almost never available. Unfortunately, even the literature is quite limited in terms of this information. Most recently, researchers at the UC Berkeley Safety Center conducted a comprehensive feasibility study along with a pilot test to assess the best ways to collect both types of information namely, flow and behavior (Greene-Roesel et al., 2007). One of the main findings of their report is the fact that automated counters are the most feasible way of collecting pedestrian data that is reliable and statistically significant in terms of its sample size. In turn, this study provides support for the need to assess the feasibility and use of automated pedestrian counters in New Jersey. Such data could fill a key information gap for the lack of this information which is one of the key parts of the overall puzzle for decision makers and planners who would like to consider pedestrian oriented multi-modal transportation options when developing their planning projects.

With the advent of new technologies that make it possible to automatically count and even track pedestrians in a wide variety of settings and transportation facilities, accurate and cost effective data collection has become a possibility. The major goals of this project as also stated in the original RFP can be summarized as follows:

1. Conduct a literature review on this topic and scope out the costs and feasibility of utilizing these technologies in NJ.
2. Create a pilot program where a limited number of automated pedestrian counters are purchased, deployed and field evaluated.
3. Assess the ease of use and value of the data to help the department to make better decisions about the feasibility of “using automated pedestrian counters” at a larger scale in the State.
4. Develop comprehensive yet easy to use guidelines for the deployment of various types of automated counters under various site-specific conditions
- 5.

1. Progress this quarter by task:

Phase 1- Literature Search: This task is completed. A draft report is prepared.

Phase 2 - Research

Task 1: Literature Review & Policy Analysis

Sub-Task 1.1: National Literature Review



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The review of the national literature related to automated pedestrian counters is being completed. The review includes but existing research on the topic conducted by other state DOT's, studies from the Transportation Research Board, The National Highway Traffic Safety Administration, and other transportation research centers. These will be complemented with the findings from other two sub-tasks to generate the final literature review and policy analysis document.

Sub-Task 1.2: Policy Review

The team conducted an audit of all twelve guidance/policy documents to single out references to pedestrian counts and or areas in the documents where pedestrian counts could help informed decision-making. We compiled audit references and created document summaries.

Sub-Task 1.3: Conduct Key Informant Interviews

Created interview protocols and had them reviewed and approved by all team members. The team began interview outreach. We sent questions to interviewees who have agreed to participate. Currently, we are scheduling and conducting interviews. We will also conduct all state DOT bicycle and pedestrian coordinators through e-mail asking about use of automated pedestrian counters.

Task 7: Project Management, Final and Quarterly Reports

This is an on-going task that includes all the project management and reporting activities required by the project.

2. Proposed activities for next quarter by task:

Task1:

1. Finish interviews.
2. After the completion of the interviews we will have a draft technical memorandum for Task 1, which will be circulated for comments / suggestions. This will be followed by a presentation to the Project Selection and Implementation Panel, to get feedback on our findings. Following this, a short list of sensors that can be used for the project will be prepared. We will then finalize technical memorandum for Task 1.

Task 2:



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3. Start work on Task 2. We will use the findings of Task 1 and the short list of counters approved counters to proceed with Tasks 2 and 3, selection of pedestrian counters and deployment sites. This next steps will be taken in close cooperation with NJDOT.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Year 1 Budget	\$ 97,455
Years 1 & 2 Cumulative Budget	\$165,876
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$165,876
Modified Contract Amount:	
Total Project Expenditure to date	\$32,340
% of Total Project Budget Expended	19.5%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Bridge Deck Cracking and Composite Action Analysis		
RFP NUMBER:		NJDOT RESEARCH PROJECT MANAGER: Lad Szalaj	
TASK ORDER NUMBER: TO 190 / RU Acct 4-22705		PRINCIPAL INVESTIGATOR: Dr. Hani Nassif	
Project Starting Date: 06/01/2006 Original Project Ending Date: 5/31/2008 Modified Completion Date: 8/31/2008		Period Covered: 2 nd Quarter 2008	

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	4.82%	\$ 10,000	0.0%	\$ -	100.0%	\$ 10,000
1	Literature Search	9.64%	\$ 20,000	0.0%	\$ -	100.0%	\$ 20,000
2	Composite Action Analysis	19.27%	\$ 40,000	0.0%	\$ -	100.0%	\$ 40,000
3	3D FEA - Composite Action	19.27%	\$ 40,000	5.0%	\$ 2,000	100.0%	\$ 40,000
4	3D FEA - NJDOT Deflection Requirements	12.04%	\$ 25,000	0.0%	\$ -	100.0%	\$ 25,000
5	3D FEA - NJDOT Class A Concrete Requirements	12.04%	\$ 25,000	0.0%	\$ -	100.0%	\$ 25,000
		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
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		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
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		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
6	Final Report and Quarterly Reporting	22.92%	\$ 47,574	3.0%	\$ 1,427	98.0%	\$ 46,623
	TOTAL	100.0%	\$ 207,574		\$ 3,427	99.5%	\$ 206,623

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Project Objectives:

The main objective of this study is to evaluate the cracking behavior of concrete bridge decks and explore the cause of the cracking problem related to design procedures. Using 3D Finite Element



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Method (FEM) as an analysis tool, the proposed project will identify the design procedures and parameters that most directly relate to the severity of cracking in bridge decks. Both AASHTO Standard Specification (LFD) and AASHTO LRFD Bridge Design Specification (LRFD) will be evaluated; especially regarding design provisions related to the shear studs and deflection limits. The identification process will be implemented in five tasks: (1) literature search; (2) evaluation of LFD and LRFD design procedures for composite action; (3) development of a detailed FE model that incorporates field measurements, environmental conditions (such as temperature and differential expansion between steel and concrete), and shrinkage behavior of concrete material based on actual data or laboratory testing; (4) deflection requirements; and (5) concrete compressive strength. The end result will be to provide a methodology that will enable New Jersey Department of Transportation (NJDOT) to successfully select the appropriate design modifications and construction guidelines that minimize the cracking potential of decks for girder bridges.

Project Abstract:

According to the American Society of Civil Engineers (ASCE) Report Card, the US infrastructure received a grade point average of “D” (i.e., poor rating) in 2005. Moreover, the National Bridge Inventory (NBI) (Federal Highway Administration, 2004) stated that of more than 594,470 bridges in the United States, about 150,981 (25.4%) are structurally deficient or obsolete. Major decisions must be made to allocate the limited funds available for repair, rehabilitation, and replacement. An investment of at least \$1.6 trillion is needed in the next five years to alleviate the problems. Accordingly, many State departments of transportation expend significant effort and resources on the construction of durable concrete bridge decks. Existing data and current research indicate that specific modifications to construction procedures, materials, and design details can significantly reduce the degree of cracking in bridge decks and thus reduce exposure of reinforcing steel to the corrosive effects of deicing chemicals as well as decrease freeze-thaw damage. A great deal is known about the factors that affect cracking in bridge decks, and what is needed is to implement this knowledge and monitor deck performance. However, there is need to fully understand the effect of various design parameters that are related to bridge cracking behavior.

To study the cracking behavior of bridge decks, a detailed 3D FE model will be developed. A general-purpose finite element program, ABAQUS, will be utilized to derive the model. ABAQUS includes a variety of routines that allow for defining specific material models and provisions, such as concrete cracking and tension stiffening models, reinforcing steel rebar, boundary conditions, bond behavior (e.g., shear studs) and interaction between the reinforcing steel bars and concrete, and its mechanical properties. In addition, early-age cracking is often associated with material properties of concrete, especially concrete mixes that have high early-age strength development or high shrinkage performance. Furthermore, the FEM results will be validated using field results from various sources including those developed at Rutgers University and relate the possible cause of cracking on the bridge decks (e.g., thermo-stresses, heat of hydration, shrinkage, and live load). Once the model is validated and calibrated using field and laboratory measurements, the parametric study on modifying the design procedure can be carried out. The results of this research will add to that knowledge and will lead to reduction in bridge deck cracking, an improvement in durability, and an increase in the useful life of bridges.



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1. Progress this quarter by task:

Task 1—Literature Search:

- The literature search has been completed.

Task 2—Composite Action Analysis

- FE model analysis of composite action analyses is completed
- Design examples and procedures for shear studs were completed .

Task 3—Perform Analysis using a 3D FE Model Considering LRFD Composite Action Requirements

- Parametric study is underway using various design alternatives

Task 4—Perform 3D FEA for Typical Bridges with NJDOT Deflection Requirements

- 3D FEA is completed for typical bridge designed by HNTB.

Task 5—Perform 3D FEA for Typical Bridges with NJDOT Class A Concrete

- A parametric study using the refine model is completed. The parameters included deck compressive strength and number of shear studs.

Task 6— Final Report and Quarterly Reporting

- The research team prepared a draft for the final report summarizing results obtained thus far in the project and will be submitted by the end of May.

2. Proposed activities for next quarter by task:

Task 1—Literature Search:

Task 2—Composite Action Analysis

Task 3—Perform Analysis using a 3D FE Model Considering LRFD Composite Action Requirements

Task 4—Perform 3D FEA for Typical Bridges with NJDOT Deflection Requirements

Task 5—Perform 3D FEA for Typical Bridges with NJDOT Class A Concrete

Task 6— Final Report and Quarterly Reporting

- Research team will finalize the draft report based on the review comments from NJDOT.

3. List of deliverables provided in this quarter by task (product date):

- Draft Final Report

4. Progress on Implementation and Training Activities:



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N/A

5. Problems/Proposed Solutions:

Year 1 Budget	\$ 75,081
Years 1 & 2 Cumulative Budget	\$207,574
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$207,574
Modified Contract Amount:	
Total Project Expenditure to date	\$206,623
% of Total Project Budget Expended	99.5 %

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of the Automated Distress Survey Equipment		
RFP NUMBER: 2008-07	NJDOT RESEARCH PROJECT MANAGER: Vincent Nichnadowicz		
TASK ORDER NUMBER: TO 224 / RU Acct 4-2XXXX	PRINCIPAL INVESTIGATOR: Carl Rascoe		
Project Starting Date: 05/01/2008 Original Project Ending Date: 07/31/2009 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Conduct Literature Search	2.11%	\$ 3,000.00	33.00%	\$ 990	33.00%	\$ 990
2	Prepare Distress Identification Manual	9.27%	\$ 13,170.00	0.00%	\$ -	0.00%	\$ -
3	Select Test Sections	24.71%	\$ 35,100.00	15.00%	\$ 5,265	15.00%	\$ 5,265
4	Vendor Selection	5.29%	\$ 7,518.00	50.00%	\$ 3,759	50.00%	\$ 3,759
5	Field Data Collection and Data Analyses	44.96%	\$ 63,850.00	0.00%	\$ -	0.00%	\$ -
6	Quarterly and Final Reports	13.65%	\$ 19,387.00	0.00%	\$ -	0.00%	\$ -
7		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
8		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
9		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
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14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
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16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.0%	\$ 142,025		\$ 10,014		\$ 10,014

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Project Objectives:

Since there are multiple vendors with this type of equipment, the Department would like to evaluate and compare these units in a side-by-side pilot for the next generation Pavement Management System data collection vehicle. The evaluation of the Automated Distress Survey Equipment to

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TEL: 732-445-0579 FAX: 732-445-3325

Eval-Automated-Distress-Survey-Equip-QR-06-01-2008-FINAL



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supplement or replace the current manual visual distress data collection could significantly improve the quality and repeatability of the PMS distress data and help the Department make better pavement rehabilitation decisions. This is especially important in this time of limited financial resources.

The objectives of this research study are to:

- Evaluate the capabilities, limitations, and repeatability of the various automated distress survey equipment technologies on various distress types on different pavement surfaces types at various distress severity levels, lighting conditions and highway speeds.
- Assess the capabilities, limitations, and repeatability of the Department's PMS rater staff on various distress types on different pavement surfaces types at various distress severity levels, lighting conditions and highway speeds.
- Assess the level of effort and time required to process the images from the automated distress survey equipment
- Determine which types of distress are better collected with the automated distress survey equipment and which distress types should continue to be collected by PMS staff.
- Determine how the data collected by the automated distress data collection equipment can be incorporated into the pavement management system.

Project Abstract:

In order to address the research objectives, the research team will conduct a comprehensive literature search to summarize the manufacture's description of the distress data collection technology and other research conducted to assess the current state-of-the-art in pavement imaging and distress identification and evaluation. The research team will meet with the PMS staff to identify 15 one-mile test sections that have a variety of pavement types (BC, CO, and RC), distress types, severity levels and extents. The team will review the Department's current distress survey protocol and develop distress definitions, and evaluation criteria for use in the research study. Based on the content of the literature search and experience of the research team, a number of automated distress survey equipment vendors representing the various distress collection technologies will be identified. These vendors will be contracted to collect three runs on each test sites in one day and conduct analyses of the image data at NJ DOT.

The PMS staff will also collect distress data using the current protocol. The testing order of the test sites will be randomly assigned. The distress type, severity and extent levels of each site will be documented for comparison between the automated distress survey equipment and the PMS raters.

Progress this quarter by task:

The kickoff meeting was held with the NJDOT research project manager and the pavement and drainage technology unit. Based on the meeting, a National survey of State DOT PMS Engineers was added to the study.



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A survey instrument was prepared and reviewed by NJDOT and the survey was distributed nationally through the FHWA Resource Center staff. The survey will be summarized in a technical memorandum.

The research team has continued to review literature.

The research team performed initial test site selection from the HPM database and GIS site identification.

The research team performed initial vendor selection for the automated distress testing.

2. Proposed activities for next quarter by task:

The literature search and survey technical memorandum will be prepared.

The initial test site selection and field verification of test sites will be performed.

Finalize test site selection. The technical memorandum on site selection will be prepared

The list of vendors will be finalized, the vendors will be confirmed and the vendor testing dates will be set. The technical memorandum on vendor selection will be prepared

The Distress Identification Manual will be prepared

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Total Project Budget	\$ 142,025.00
Modified Contract Amount:	
Total Project Expenditure to date	\$10,014
% of Total Project Budget Expended	7%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Development of FWD Procedures Manual		
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Vincent Nichnadowicz		
TASK ORDER NUMBER: TO 220 / RU Acct 4-27288	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski		
Project Starting Date: 01/01/2008 Original Project Ending Date: 12/31/2008 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Project Initiation	16.98%	\$ 15,350	0.00%	\$ -	100.00%	\$ 15,350
2	FWD Operation Procedure	25.27%	\$ 22,850	20.00%	\$ 4,570	100.00%	\$ 22,850
3	FWD Data Analysis Procedure	20.05%	\$ 18,130	30.00%	\$ 5,439	30.00%	\$ 5,439
4	FWD Guide Preparation	20.15%	\$ 18,220	30.00%	\$ 5,466	30.00%	\$ 5,466
5	On-call Field and Laboratory Testing Services and Analysis	9.18%	\$ 8,300	0.00%	\$ -	0.00%	\$ -
6	Final Report and Quarterly Reporting	8.37%	\$ 7,573	0.00%	\$ -	0.00%	\$ -
7		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
8		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
9		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.0%	\$ 90,423		\$ 15,475		\$ 49,105

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Project Objectives:

The main objective of this project is to develop FWD Testing and Analysis Guidelines for NJDOT – an *FWD Procedures Manual*. These guidelines will document the desired approach in FWD testing and analysis for the purpose of project-level rehabilitation design using MEPDG. The developed guidelines will clearly define:

- the FWD testing requirements,
- data analysis approach, and
- reporting requirements

in a way that ensures data integrity and also ensures that the FWD data is collected and analyzed in a consistent, technically sound, and state-of-practice manner. Additionally, the developed guidelines will serve the purpose of providing NJDOT with an improved specification for acquiring FWD testing and backcalculation services, as well as providing guidance for NJDOT internal staff conducting FWD testing and analysis.

Project Abstract:

For pavement rehabilitation projects, the MEPDG relies heavily on the material stiffness backcalculated from the deflection measurements taken from existing pavements. These measurements are typically made using FWD or HWD equipment. In recent years, several testing protocols and procedures for the collection of deflection data have been developed and used by different organizations. These protocols and procedures include information about load levels, number of drops per load level, temperature measurements, sensor configuration, etc. In order to ensure the consistency of the measurements, and therefore the estimation of material stiffness values that will be used in MEPDG, NJDOT will require a standard testing procedure and analysis protocols.

1. Progress this quarter by task:

In this quarter, Task 2 of the project has been completed, namely:

- Literature review presentation
- Development of draft FWD Operations Procedure part of manual, including findings of literature review

In addition, Task 3 - FWD Data Analysis Procedure - has been initiated and an initial draft of the task deliverable, the FWD Data Analysis portion of the manual, is underway.

2. Proposed activities for next quarter by task:

It is anticipated to continue progressing in Task 3 and the task deliverable (FWD Data Analysis portion of the manual).

Work is anticipated to begin on finalizing the two draft portions of the manual.

3. List of deliverables provided in this quarter by task (product date):



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Draft FWD Operations Procedure portion of manual, including findings of literature review.

4. Progress on Implementation and Training Activities:

No Progress this quarter

5. Problems/Proposed Solutions:

The main difficulty at present is the lack of a contract.

Year 1 Budget	\$90,423
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$90,423
Modified Contract Amount:	
Total Project Expenditure to date	\$49,105
% of Total Project Budget Expended	54.31%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Self Cleaning and De-Polluting Geopolymer Coatings for Graffiti Prevention and Removal-Demo Project						
RFP NUMBER: 200X-XXX				NJDOT RESEARCH PROJECT MANAGER: Robert Sasor			
TASK ORDER NUMBER: TO 211 / RU Acct 4-28959				PRINCIPAL INVESTIGATOR: Dr. P. Balaguru			
Project Starting Date: 10/15/2007 Original Project Ending Date: 10/15/2008 Modified Completion Date:				Period Covered: 2nd Quarter 2008			

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Literatuare Search	5.12%	\$ 5,123	15.00%	\$ 768	90.00%	\$ 4,611
2	Self Cleaning & Depolluting Study	28.00%	\$ 28,000	5.00%	\$ 1,400	10.00%	\$ 2,800
3	Coating Color & Field Application -A-	6.00%	\$ 6,000	10.00%	\$ 600	80.00%	\$ 4,800
4	Coating Color and Field Application -B-	6.00%	\$ 6,000	0.00%	\$ -	0.00%	\$ -
5	Graffiti Removal Method	24.50%	\$ 24,500	10.00%	\$ 2,450	20.00%	\$ 4,900
6	Geopolymer Cost Estimate	1.50%	\$ 1,500	0.00%	\$ -	0.00%	\$ -
7	Compare Geopolymer to Other Coatings	3.50%	\$ 3,500	0.00%	\$ -	0.00%	\$ -
8	Develop Generic Specification	3.00%	\$ 3,000	0.00%	\$ -	0.00%	\$ -
9	Field Demostration of Graffiti Removal	5.00%	\$ 5,000	10.00%	\$ 500	10.00%	\$ 500
10	Monitor Coating Long Term	6.00%	\$ 6,000	0.00%	\$ -	0.00%	\$ -
11	Final Re[p]rt and Quarterly Reporting	8.88%	\$ 8,877	0.00%	\$ -	0.00%	\$ -
12	Training and Implementation Plan	2.50%	\$ 2,500	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 100,000		\$ 5,718		\$ 17,611

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Project Objectives:

The primary objective of the proposed study is to demonstrate the effectiveness of the inorganic coating for graffiti prevention and removal. Since other formulations are available in the market, the study will have the following components.

- (1) Field demonstration of the inorganic coating for graffiti prevention and removal, and
- (2) Cost comparison of this coating with other available products, for both initial application and maintenance, based on the cost for graffiti removal.

In addition, laboratory and field studies will be conducted to document properties pertaining to:

- (3) Self cleaning, and
- (4) De-pollution.

Project Abstract:

A site has been selected for the demonstration application and testing of graffiti removal. It is a retaining wall located on a ramp from Route 1 North to the Woodbridge Mall. The wall is about 200 feet long and has an average height of about 7 feet and is easily accessible. Since the surface to be coated faces a parking lot, traffic control is not needed and sufficient space is available for both application of the coating and tests for graffiti removal. The wall and four concrete boards will be coated with the inorganic coating. Two concrete boards will be brought to the laboratory for evaluating the most efficient graffiti removal techniques and for studying self cleaning and de-pollution properties. The other two concrete boards will be kept outside the lab to test for outdoor exposure.

In addition, a specification will be prepared for using the geopolymer coating as an anti-graffiti, self cleaning and de-polluting surface treatment. A performance and cost comparison study between this coating material and other commercially available products will also be conducted.

1. Progress this quarter by task:

The literature search is almost complete. We are also developing different color combinations for darker applications. We tested more samples for graffiti removal techniques. Hot water and citric solutions work well.

2. Proposed activities for next quarter by task:

Complete the literature search
Finalize color combination for the two applications
Finalize graffiti removal techniques
Visit the site to determine the color co-ordination
Meet with DOT personnel for color co-ordination

3. List of deliverables provided in this quarter by task (product date):

None



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4. Progress on Implementation and Training Activities:

None

5. Problems/Proposed Solutions:

Year 1 Budget	\$100,000
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$100,000
Modified Contract Amount:	
Total Project Expenditure to date	\$ 17,611
% of Total Project Budget Expended	17.61%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Dynamic Modulus of Hot Mix Asphalt		
RFP NUMBER: 2003-10	NJDOT RESEARCH PROJECT MANAGER: Camille Crichton-Summers		
TASK ORDER NUMBER: TO 199 / RU Acct 4-26619	PRINCIPAL INVESTIGATOR: Ali Maher/Thomas Bennert		
Project Starting Date: 01/01/2007 Original Project Ending Date: 12/31/2009 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	11.19%	\$ 25,000	0.0%	\$ -	100.0%	\$ 25,000
2	Literature Search	2.24%	\$ 5,000	0.0%	\$ -	100.0%	\$ 5,000
3	Develop Test Plan	2.24%	\$ 5,000	0.0%	\$ -	100.0%	\$ 5,000
4	Conduct E* Testing and Database Development	26.85%	\$ 60,000	25.0%	\$ 15,000	85.0%	\$ 51,000
5	Compare Measured E* to Predicted E*	8.43%	\$ 18,835	25.0%	\$ 4,709	70.0%	\$ 13,185
6	Conduct Sensitivity Analysis of E*	15.66%	\$ 35,000	25.0%	\$ 8,750	45.0%	\$ 15,750
7	Conduct Round Robin Testing	11.24%	\$ 25,117	0.0%	\$ -	100.0%	\$ 25,117
8	Develop Final Database	7.83%	\$ 17,500	50.0%	\$ 8,750	70.0%	\$ 12,250
9	Final Report and Quarterly Reporting	14.32%	\$ 32,032	10.0%	\$ 3,203	35.0%	\$ 11,211
10		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
11		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
12		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
13		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
14		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
15		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
16		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
17		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
18		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
19		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
20		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
	TOTAL	100.00%	\$ 223,484		\$ 40,412		\$ 163,513

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Project Objectives:

The objective of the research project is to provide the NJDOT with a clear understanding of the dynamic modulus test and its precision, the typical E^* values of their native HMA materials, and the accuracy of the prediction equations that are proposed for use in the MEPDG.

Project Abstract:

The most critical parameter needed for the upcoming Mechanistic Empirical Pavement Design Guide (MEPDG) is the dynamic modulus (E^*), which will be used for flexible pavement design. The dynamic modulus represents the stiffness of the asphalt material when tested in a compressive-type, repeated load test. The dynamic modulus will be the key parameter used to evaluate both rutting and fatigue cracking. The computer software that will accompany the MEPDG will provide general default parameters for the dynamic modulus. However, caution has already been issued by the National Cooperative Highway Research Program (NCHRP) researchers as to the appropriateness of these parameters for regional areas. The major concern is that state agencies will use these default values blindly and sacrifice accuracy of the design. Hence, making the new mechanistic procedure no better than using a structural number (SN) with the old AASHTO method.

To ensure that the New Jersey Department of Transportation (NJDOT) will be prepared for the upcoming design procedure, a research proposal has been developed. The research proposal will encompass evaluating the dynamic modulus of approximately twenty different hot mix asphalt designs that are currently specified by the NJDOT. The dynamic modulus will be determined based on the most current testing protocol (AASHTO TP62). The dynamic modulus (E^*) will be represented using a technique called a *master curve*. The E^* master curve is a single curve that represents the asphalt materials stiffness relationship to loading frequency and temperature. The master curve for each material tested will be developed and its sigmoidal curve fitting parameters (α , β , γ , δ) determined. This procedure is called Level I for the MEPDG and will provide the most realistic results during design. The measured E^* values will be compared to that of the Witczak predictive equation and the Hirsch model. The Witczak predictive equation has been selected by the NCHRP researchers for the Level II and III design. The Level II will provide accurate results, although not as accurate as actually measuring the E^* in the laboratory. The predictive equation is based on the mix gradation, asphalt binder viscosity properties, and volumetric properties of the hot mix asphalt. The accuracy of the predictive equation will be determined, as well as possible methods to “shift” the predictive equation to more closely represent New Jersey materials.

Another important aspect of the research project is the development of a “precision-type statement” for use by the NJDOT regarding the dynamic modulus test. Currently, a precision statement does not exist regarding multiple laboratories. Eight laboratories were contacted and asked to participate in a round robin study regarding the dynamic modulus test. All laboratories are AMRL accredited for hot mix asphalt and will provide valuable information regarding the expected precision the NJDOT can expect if dynamic modulus testing is to be conducted by outside laboratories.



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1. Progress this quarter by task:

MEPDG E* Catalog:

All testing for the mixes collected during the 2007 construction season have been tested and analyzed. All specimens were evaluated at air void levels indicative of field construction density levels (between 6% and 7% air voids). The following mixes are currently incorporated in the E* design catalog:

- 9.5H76 (2 suppliers)
- 12H76 (3 suppliers)
- 19H76 (2 suppliers)
- 12H64 (1 supplier)
- 12M76 (1 supplier)
- 12M64 (2 suppliers)
- 25M64 (1 supplier)
- 9.5mm SMA (1 supplier)
- 12.5mm SMA (1 supplier)

The supplier location will also be indicated in the catalog to allow NJDOT suppliers to select E* database values that represent regional areas (i.e. – pavement design conducted in North Jersey will have E* data that represents HMA from North Jersey).

Materials have also been collected from the early projects of the 2008 season. These materials will also be tested and added to the database. They include:

- 12H76 (2 suppliers)
- 19H76 (1 supplier)
- 19M64 (1 supplier)
- 9.5mm SMA (1 supplier)

Incorporating the recently collected materials will bring the E* catalog up to 19 different mixes/suppliers. More importantly, NJDOT will have 5 separate suppliers represented for NJDOT's 12H76, which is the most common HMA mix currently specified by NJDOT.

Along with the E* testing of the different plant produced mixtures, low temperature Creep Compliance and Indirect Tensile Tests are being conducted on the surface course mixes (9.5 and 12.5 H mixes). Both parameters are required for the surface course mix to predict low temperature cracking. Along with the low temperature properties, Simple Performance Repeated Load testing is also being measured to compare rutting performance of the different mixtures as well.

Comparison of Measured E* and Predicted E*

Two dynamic modulus prediction equations are being evaluated in the study; 1) Witczak Prediction Equation (WPE) and 2) Hirsch Model. The WPE is currently being implemented in the MEPDG software program, while the Hirsch Model has gained popularity as an alternative method for predicting the dynamic modulus.



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Preliminary results have shown that both equations provide a relatively good prediction at intermediate and low temperatures. High temperature predictions show a greater percent difference when compared to the measured E^* values. This is in agreement with previous published work and examples of the results will be shown in detail at the Quarterly Meeting.

What was also encouraging from the analysis of the prediction equations was that the binder characterization using the Rolling Thin Film Oven (RTFO) seems to age the asphalt binder in a manner that characterizes the mixture aging. There was some initial fear that the RTFO aged binder, required in the Hirsch Model, may not represent the aged binder in the collected plant produced mixtures. However, based on the favorable comparisons between the measured E^* and the Hirsch Model predictions, the RTFO procedure appears to be appropriate.

2. Proposed activities for next quarter by task:

The predominant activity of the next quarter will be the organization and final development of the E^* Catalog. The catalog will provide NJDOT with all of the measured dynamic modulus data collected for all mixtures, as well as the low temperature creep compliance and indirect tensile strength of selected surface course mixtures. The catalog will provide regional locations for the mixtures, as well as asphalt binder data required for the Materials Input of the MEPDG, and the Witczak and Hirsch Prediction models.

3. List of deliverables provided in this quarter by task (product date):

NA

4. Progress on Implementation and Training Activities:

NA

5. Problems/Proposed Solutions:

NA

Year 1 Budget	\$223,484
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$223,484
Modified Contract Amount:	
Total Project Expenditure to date	\$163,513
% of Total Project Budget Expended	73.2%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Inorganic Protective Coatings and Fiber Reinforced Polymers: Route 47 Wildwood Drawbridge Bridge House Rehabs		
RFP NUMBER: 200X-XXX	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor		
TASK ORDER NUMBER: TO 215 / RU Acct 4-28972	PRINCIPAL INVESTIGATOR: P. Balaguru		
Project Starting Date: 11/01/2007 Original Project Ending Date: 10/31/2008 Modified Completion Date:	Period Covered: 2nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Rehabilitate North Tower	31.43%	\$ 11,000	85.00%	\$ 9,350	90.00%	\$ 9,900
2	Rehabilitate South Tower	62.86%	\$ 22,000	75.00%	\$ 16,500	92.00%	\$ 20,240
3	Monitor Coating, FRP, and Other Repairs	1.43%	\$ 500	0.00%	\$ -	0.00%	\$ -
4	Final Report	4.28%	\$ 1,500	0.00%	\$ -	0.00%	\$ -
5		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
6		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
7		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
8		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
9		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 35,000		\$ 25,850		\$ 30,140

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Project Objectives:

Repair two bridge-house towers to prevent deterioration due to leaking and salt intrusion.

Project Abstract:

The bridge-house towers have problems due to leaking and salt intrusion. These problems will be fixed using fiber reinforced systems and inorganic coatings.

100 BRETT RD. PISCATAWAY NJ 08854-8058

TEL: 732-445-0579 FAX: 732-445-3325



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1. Progress this quarter by task:

The repair and rehabilitation of both towers are essentially complete.

2. Proposed activities for next quarter by task:

Monitor the structures and do any further repairs.

3. List of deliverables provided in this quarter by task (product date):

None

4. Progress on Implementation and Training Activities:

None

5. Problems/Proposed Solutions:

None

Year 1 Budget	\$35,000
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$35,000
Modified Contract Amount:	
Total Project Expenditure to date	\$ 30,140
% of Total Project Budget Expended	86.11%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Development of Uniform Standards for Allowable Lane Closure/Web Interface	
RFP NUMBER: 2007-06		NJDOT RESEARCH PROJECT MANAGER: W. M. Szalaj
TASK ORDER NUMBER: TO 197 / RU Acct 4-22774		PRINCIPAL INVESTIGATOR: Dr. Kaan Ozbay/Dr. Bekir Bartin
Project Starting Date: 01/01/2007 Original Project Ending Date: 12/31/2007 Modified Completion Date: 08/31/2008		Period Covered: 2 nd Quarter 2008



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Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	16.22%	\$ 30,000	0.00%	\$ -	100.00%	\$ 30,000
2	Literature Search	5.41%	\$ 10,000	0.00%	\$ -	100.00%	\$ 10,000
3	Literature Review	8.11%	\$ 15,000	0.00%	\$ -	100.00%	\$ 15,000
4	Assemble Technical Panel	5.79%	\$ 10,704	5.00%	\$ 535	35.00%	\$ 3,746
5	Review of Current Practice	8.65%	\$ 16,000	20.00%	\$ 3,200	100.00%	\$ 16,000
6	Lane Closure Software	41.07%	\$ 76,000	30.00%	\$ 22,800	80.00%	\$ 60,800
7	Final Report	3.94%	\$ 7,296	25.00%	\$ 1,824	50.00%	\$ 3,648
8	Training	10.81%	\$ 20,000	0.00%	\$ -	75.00%	\$ 15,000
9		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 185,000		\$ 28,359		\$ 154,194

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Project Objectives:

Objective 1: *Estimate delays caused by lane closures*

- Develop an algorithm utilizing existing software or development of a software for determining allowable lane closure hours.
- Develop a simple application based on the cost/benefit guideline for traffic delays vs. contractor productivity (This objective is added by the research team because it is important to allow the decision makers to easily calculate costs and benefits based on the delays calculated by the above delay estimation algorithm. This will definitely improve the efficiency of the overall decision-making process).
- Develop data requirements for proper and accurate modeling.

Objective 2: *Develop a computer implementation of the developed delay estimation approach*



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- Develop a data interface for streamlining existing Department traffic data into the modeling software.
- Develop a web interface for the product.

Objective 3: *Develop uniform and well-accepted lane closure guidelines*

- Develop performance standards for acceptable delay for planned lane closures.
- Develop a cost/benefit guideline for traffic delays vs. contractor productivity.
- Develop a process for modifying lane closure hours.

Objective 4: Conduct training

- Develop a training program and manual for use of the software process.
- Train NJDOT personnel who will be involved in lane closure decision making

Project Abstract:

According to the RFP issued by NJDOT, “requests for allowable lane closure hours to perform maintenance, construction, resurfacing, regional permit, and major access permit on the state highway system are currently being evaluated using a time consuming and inconsistent process“. According to the same problem statement, “the current process involves *the collection of traffic volumes, consultation with local authorities and the reliance on previous knowledge of the roadway to develop allowable lane closing hours*”. It is clear that this is an ad-hoc process that is not uniform and does not make use of traffic engineering basics to assess the impacts of lane closures. Thus, there is a need “to develop a process for determining and modifying lane closures that will have **uniformity** and take into account effects on **productivity and traffic delay**. Major two goals of this problem statement are then:

1. Develop a *uniform process* for lane closures that takes into account the impact of lane closure on traffic and productivity
2. Adopt this uniform process throughout the NJDOT

1. Progress this quarter by task:

Task 2. Literature Search: This task is complete.

Task 3. Literature Review: This task is complete.



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Task 4. Assemble / Coordinate with Technical Panel: Limited activity this quarter in terms of interacting with the technical panel mainly due to difficulty in scheduling meeting with NJDOT experts. However, we continued to individually work / interact with some of the members of the technical panel especially in terms of obtaining data and testing prototype version of RILCA.

Task 5: Review of Current Practice: This task is complete. We worked with our subcontractor, RPI on this task. They provided us with information about state-of-practice and also reviewed the process we are using in this task.

Task 6. Lane Closure Software: We incorporated the hourly link volumes in RILCA software additional 12 highways. The final set of freeways cover the majority of freeways in NJ. The complete list of the highways included in RILCA is as follows: I-278, I-78, I-280, HWY 24, I-76/I-676, NJ 3, Atlantic City Expressway, Palisades Interstate Parkway, NJ 19, NJ 29, NJ 440, NJ 495, HWY 287, I-195, I-95, I-80 and I-295.

Hourly traffic counts for the freeways are generated using the AADT information and hourly loop detector counts available on the NJDOT website as follows:

$$\text{Hourly Volume} = \text{AADT} * \text{D} * \text{K} * \text{H}$$

Where, D is the daily factor, K is the monthly factor and H is the hourly factor.

These seasonal, daily and hourly factors allow users to observe the effect of lane closures from one month to another. The use of an average traffic volume, such as AADT would be erroneous in the estimation of allowable lane closure hours since traffic counts change considerably from February to August for example. Similarly, lane closure hours change from a weekday to a weekend due to different hourly demand patterns. Therefore, the use of these factors is essential in estimating accurate lane closure hours.

Daily factor, monthly and hourly factors are obtained from the loop detector data available online. However, these dataset is limited in size. Therefore, if D, K or H values are not available or missing for a given freeway at one of the traffic counting stations, the information is copied from the closest traffic count station on the same freeway that has complete D, H and K information.

2. Proposed activities for next quarter by task:

1. We will install RILCA on one or two more regular users' computers in Operations North headquarters for further testing.
2. Rutgers team will hold a second training for RILCA in July 2008. The training session will be a half-day hands-on workshop that involves NJ specific lane closure projects. The training will be held in NJDOT headquarters.

3. List of deliverables provided in this quarter by task (product date):



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Prototype GIS based lane closure application tool including : I-278, I-78, I-280, HWY 24, I-76/I-676, NJ 3, Atlantic City Expressway, Palisades Interstate Parkway, NJ 19, NJ 29, NJ 440, NJ 495, HWY 287, I-195, I-95, I-80 and I-295 with the link volumes and the lane closure application..

4. Progress on Implementation and Training Activities:

- A prototype version of RILCA is installed on a laptop. We will lend this laptop to Eddy Exantus on May 30, 2008. Based on his comments and feedback, we will then modify the tool to fit his needs. This step is also crucial to detect any bugs in the software.
- We will continue to work with the technical panel in terms of holding two more training sessions for QuickZone and RILCA and getting their feedback. As part of this efforts:
 1. Noblis will hold another QuickZone training session in June 2008. As requested by the NJDOT staff this training session will be more NJ specific and a real-world project oriented, hands-on training. The training will be held in the computer lab at NJDOT headquarters. We will coordinate this effort with Tim Bourne.
 2. Rutgers Intelligent Transportation Systems (RITS) team will hold a separate training for RILCA in July 2008. The training session will be a half-day hands-on workshop that involves NJ specific lane closure projects. The training will be held in NJDOT headquarters. We will coordinate this effort with Tim Bourne.
- We will also deliver a user's manual with step-by-step examples that will make it easier for the new users to learn the software. We will work with RPI (Professor Ukkusuri) in finalizing this manual.

5. Problems/Proposed Solutions:

Eddy Exantus's computer was giving errors when we installed RILCA. Therefore, we decided to lend him a laptop that will enable him to check and get more familiarized with the software in the short run.

Year 1 Budget	\$185,000
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$185,000
Modified Contract Amount:	
Total Project Expenditure to date	\$154,194
% of Total Project Budget Expended	83.35%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Flexible Overlays for Rigid Pavements		
RFP NUMBER: 200X-XXX	NJDOT RESEARCH PROJECT MANAGER: Lad Szalaj		
TASK ORDER NUMBER: TO 184 / RU Acct 4-26554	PRINCIPAL INVESTIGATOR(S): Dr. Ali Maher/Mr. Thomas Bennert		
Project Starting Date: 1/1/2006 Original Project Ending Date: 12/31/2007 Modified Completion Date: 12/31/2008	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	6.80%	\$ 45,000.00	0.0%	\$ -	100.0%	\$ 45,000
2	Literature Search	2.70%	\$ 17,500.00	0.0%	\$ -	100.0%	\$ 17,500
3	3-D FEM Modeling	37.50%	\$ 250,412.00	0.0%	\$ -	95.0%	\$ 237,891
4	HMA Mixture Design for HMA Overlay Materials	26.90%	\$ 179,588.00	0.0%	\$ -	100.0%	\$ 179,588
5	Laboratory Test Simulation to Match Model Prediction	15.90%	\$ 105,850.00	0.0%	\$ -	100.0%	\$ 105,850
6	Development of Draft HMA Mixture Specifications	3.10%	\$ 20,066.00	0.0%	\$ -	100.0%	\$ 20,066
7	Development of "Decision Tree" Protocol for the Design of Flexible Overlays on Rigid Pavements	3.00%	\$ 19,577.00	15.0%	\$ 2,937	90.0%	\$ 17,619
8		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
9		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
10		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
11		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
12		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
13		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
14		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
15		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
16		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
17		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
18		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
19		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
20	Final Report and Quarterly Reporting	4.10%	\$ 30,689.00	25.0%	\$ 7,672	75.0%	\$ 23,017
	TOTAL	100.00%	\$ 668,682		\$ 10,609		\$ 646,531

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Project Objectives:

The objective of the research project is to develop guidelines for the NJDOT to properly select flexible pavement “systems” that can provide sufficient pavement life when used on rigid pavements (PCC).

Project Abstract:

Although reflective cracks significantly shorten the pavement service life, there is a lack of a performance-based HMA mixture design specification for routine use to develop HMA mixtures for use as flexible overlays for rigid pavements. Furthermore, neither the NCHRP 1-37A (Mechanistic-Empirical Pavement Design Guide) nor NCHRP 9-17 (Superpave Support and Models Management) specially address laboratory tests or mixture design procedures for the evaluation of reflective cracking, although the recently initiated NCHRP 1-41 (Models for Predicting Reflective Cracking of Hot Mix Asphalt Overlays) led by the Texas Transportation Institute (TTI) will try to provide guidance on these issues. Therefore, there is an urgent need to develop a performance-based HMA mixture design specification for different HMA mixtures for New Jersey, as well as evaluate and characterize new HMA mixtures and additives, to aid in resisting/prolonging the on-set of reflective cracking.

The research study will utilize information from literature searches, surveys, finite element modeling, and extensive field and laboratory testing to develop guidelines for use in the HMA overlay design of composite/PCC pavements. A “Decision Tree” system, that will utilize field forensic testing, as built information, and traffic, will also be developed, which will aid the NJDOT is designing longer life HMA overlays for rigid pavements.

1. Progress this quarter by task:

1a. Deflection Spectra Modeling/Prediction of Reflective Cracking

Prediction of reflective cracking using the Deflection Spectra Approach was completed for Rt 34N and Rt 202S test sections. The prediction results compare favorably to the observed cracking, verifying the coupled use of FWD testing and Flexural Beam Fatigue material characterization does a reasonable job at predicting time to reflective cracking, especially for HMA overlays on top of the reflective crack relief interlayer (RCRI) mixtures. Figure 1 shows results from the Rt 34N test section (South Strata Section). The data shown represents “crack jumping” mode, where the interlayer material does not crack. (It should be noted that the cracking shown in Figure 1 represents the percent of transverse joints, previously tested by the FWD that would result in reflective cracking. Transverse crack length is not included. Therefore, actual cracking at the joint could be fairly minor to moderate.) Due to vertical movements at the top of the interlayer, and bottom of the interlayer overlay material, reflective cracking results due to poor fatigue resistance of the overlaying HMA. In the case of Rt 34N, this was a 12M76. Elastic Layer Analysis (ELA) shows that the interlayer mixtures typically absorb 30 to 40% of the vertical deflections. The interlayer overlay, in the case of Rt 34N a 12M76, must then be able to withstand the remaining 70 to 60%. This methodology could potentially allow for a performance-related material specification for HMA overlays that are to be placed on top of RCRI mixtures.



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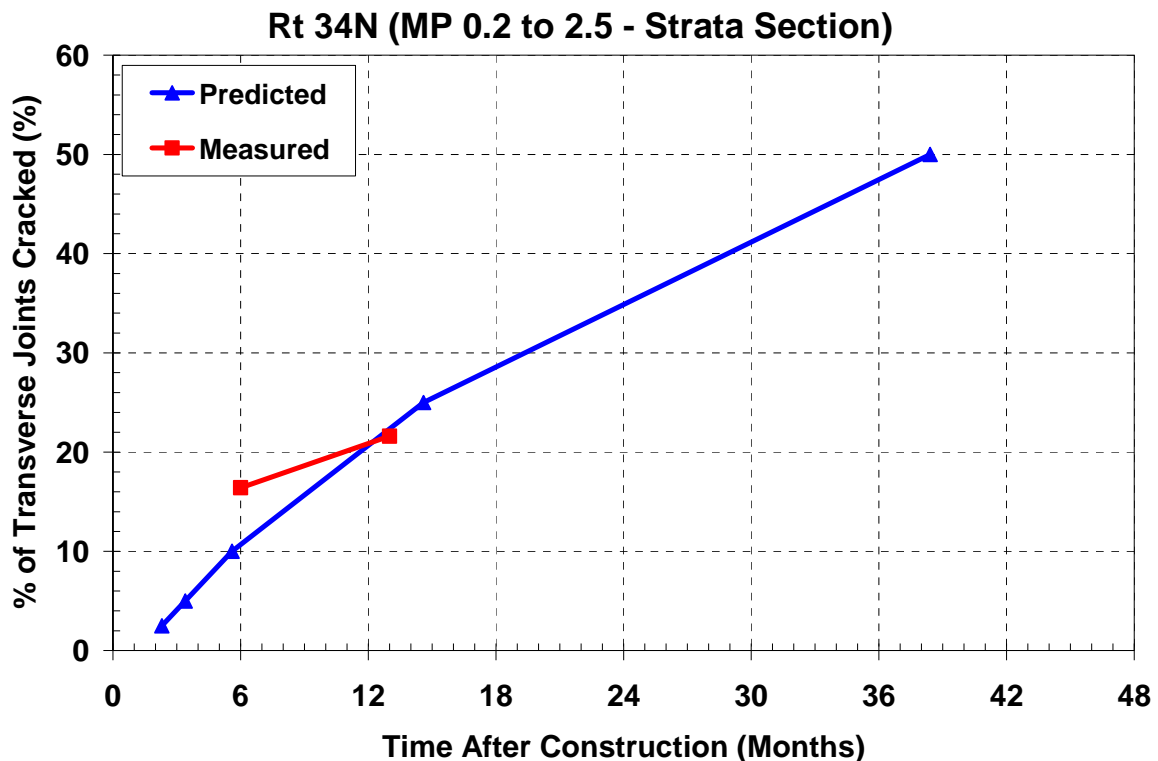


Figure 1 – Deflection Spectra Prediction of Reflective Cracking (Rt 34N – South Strata Section)

Similar analysis was also conducted for a section of I495 in Massachusetts where extensive, premature cracking was witnessed on a 2-inch HMA overlay. MassHighway officials believed that the installation of a 2-inch Leveling Course in the late Fall would last until the early 2008 paving season when additional HMA would be overlaid. However, within the first 2 months after construction, almost every transverse joint had reflected through. FWD and traffic ESAL's were provided to Rutgers for analysis. Figure 2 shows the results of the Deflection Spectra Approach. The figure shows that cracking would occur within the first 1 to 2 months of service – matching the field observations.



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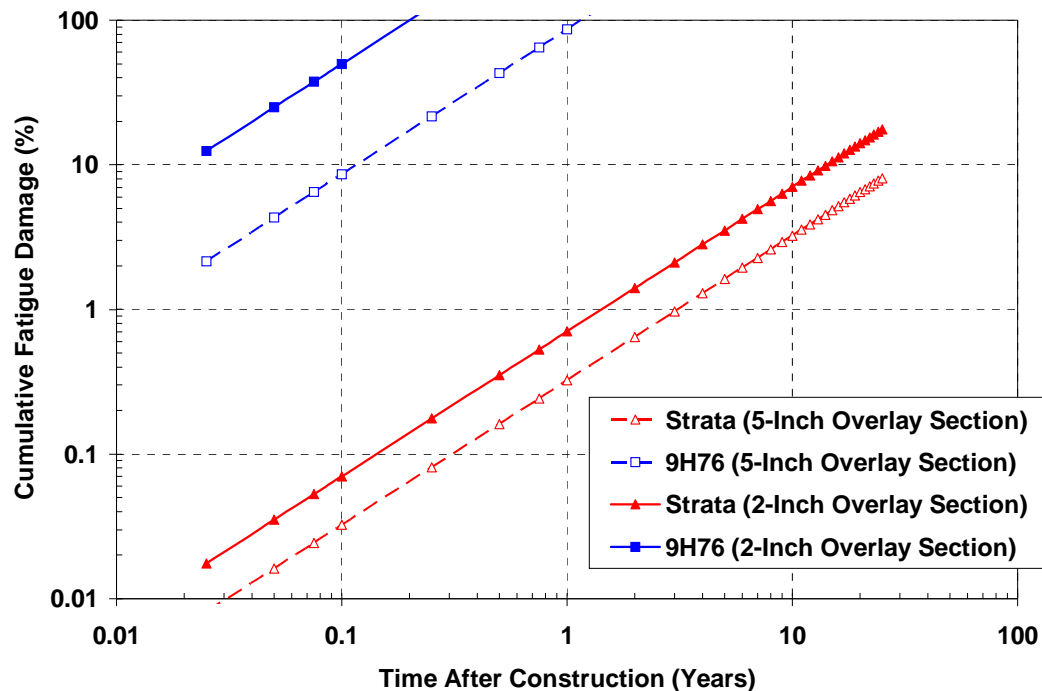


Figure 2 – Cracking Life Predictions for Dense-Graded HMA and a Reflective Crack Relief Interlayer on I495 in Massachusetts

Continual refinement of the prediction method is taking place to incorporate other factors like; HMA thickness, Load Transfer Efficiency, and Coefficient of Thermal Expansion.

2. Proposed activities for next quarter by task:

2a. Continued Material Evaluation of Rt 29 Test Section

The Rt 29 test section is slightly different than the previous two test sections. On Rt 29, poor joints in the PCC were stabilized prior to HMA overlay and measured traffic levels were less than previously measured on Rt 34N and Rt 202S. Therefore, instead of a Reflective Crack Relief Interlayer (RCRI) mixture, a Rich Bottom Layer (RBL) mixture was used. The RBL is similar in gradation to the RCRI, however the asphalt binder is a PG70-28 instead of the highly modified RCRI binder. Laboratory testing, consisting of the Deflection Spectra and Overlay Tester are currently being conducted.

2b. Construction of 4th and Final Test Section – Rt 73

Due to delays in the bidding process for the project, the Rt 73 construction is being delayed until mid-July. Unfortunately, this will most likely not allow for the data to be incorporated into the prediction analysis.

Rt 73 is the first test section where the proposed pavement design was based on the database of laboratory testing conducted on various mixes sampled in New Jersey during the 2007 construction season. On Rt 73, the High Performance Thin Overlay (HPTO) mix, developed under this research



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project, is to be placed as a leveling course with a 12.5mm SMA mix overlaying the HPTO mix. Both mixtures were evaluated in the Overlay Tester for cracking resistance and were found to be two of the better performing mixes tested.

During construction, CAIT representatives will be on-site to observe the placement of the different mixtures, as well as sample the different mixtures for laboratory evaluation.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Year 1 Budget	\$382,009
Years 1 & 2 Cumulative Budget	\$668,682
Years 1, 2 & 3 Cumulative Budget	N.A.
Total Project Budget	\$668,682
Modified Contract Amount:	
Total Project Expenditure to date	\$646,531
% of Total Project Budget Expended	96.7%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Safety Comparison of Roadway Design Elements of Urban Collectors with Access		
RFP NUMBER: 2007-08	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath		
TASK ORDER NUMBER: TO 202 / RU Acct 4-22775	PRINCIPAL INVESTIGATOR: Dr. Kaan Ozbay/Mr. Bekir Bartin		
Project Starting Date: 01/01/2007 Original Project Ending Date: 12/31/2007 Modified Completion Date: 12/31/08	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	19.78%	\$ 30,000	0.00%	\$ -	100.00%	\$ 30,000
2	Phase 1: Literature Search	6.59%	\$ 10,000	0.00%	\$ -	100.00%	\$ 10,000
3	Task 1: Literature Review	13.19%	\$ 20,000	0.00%	\$ -	100.00%	\$ 20,000
4	Task 2: Case Studies	34.73%	\$ 52,679	15.00%	\$ 7,902	80.00%	\$ 42,143
5	Task 3: Review of Existing Strategies	19.12%	\$ 29,000	0.00%	\$ -	80.00%	\$ 23,200
6	Task 4: Final Report	6.59%	\$ 10,000	10.00%	\$ 1,000	50.00%	\$ 5,000
7		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
8		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
9		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 151,679		\$ 8,902		\$ 130,343

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Project Objectives:

1. Select sites where safety improvements have been implemented.
2. Collect before and after crash data in addition to geometry and traffic data.
3. Use a statistically robust evaluation technique to determine the impact of these treatments.
4. Translate these results into so-called "Accident Modification Factors" for the representative case studies.
5. Analyze and interpret the results and provide recommendations.



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Project Abstract:

The **main goal** of this study identified by NJDOT can be defined as “the quantification of the effects of management treatments on roadway operations and safety on urban collectors with access”.

Since, urban collector road runs through highly diversified areas, various factors have to be considered when before-and-after comparisons of improvements in terms of safety are conducted in this study. For 25-40 mph urban collectors with access, these are:

1. Increase in lane widths (10' or 11' to 12'),
2. Construction of 4,6,8, or 10 foot shoulders,
3. Removal of trees in median and border areas,
4. Installation of guide rails, and vertical & horizontal geometry changes to improve sight distances.

A number of sites along 25-40 mph urban collectors with access where safety improvements have been implemented will be determined in close collaboration with NJDOT. Special attention will be given to the selection of sites that accurately represent the design elements described above. Once the site selection process is completed, historical crash data for each of these sites will be collected.

NJDOT crash database is the main source of data for this comparative evaluation study. The impact of improvements on safety will be determined by an analysis of this NJDOT crash database for a period of three years before and three years after the implemented roadway treatment. In addition to the crash data, traffic and other relevant data will also be collected because the selection of technique to be implemented will be based on its impact of safety as well traffic performance. Thus, the final determination of the impacts of the potential techniques for future candidate sites will be based on a combined assessment of their impacts on traffic performance and safety are important considerations when deciding.

1. Progress this quarter by task:

Phase 1 - Literature Search: This task is completed. .



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Task 1. Literature Review: This task is completed.

Task 2. Case Studies: We are currently working 8 case studies in NJ and 2 case studies in other States (Ohio and California).

- We obtained data for all the sites. We finalized preliminary analysis of the data for all the site.
- We completed site visits to visually identify improvements as suggested in the last QR meeting.
- We identified control sites to be able to conduct statistically more robust before-after comparisons. We conducted site visits to these sites to ensure that they comply with our requirements.
- For treatments that are in Ohio and California, we identified control sites from these States databases.

Task 3: Review of Existing Strategies:

Using the data obtained and compiled in Task 4, we continued the review of the existing strategies. The first step, which is the naïve before-after comparison for 8 NJ sites and 2 sites from other States is now complete. We presented our findings to NJDOT research panel during the QR meeting. We are now conducting before-after comparisons with control data. We expect to complete this sub-task by the end of May, 2008.

2. Proposed activities for next quarter by task:

We will continue to work on Tasks 4 and 5. We will complete the before-after analysis for the 8 NJ sites using EB methodology described in proposal. Then we will incorporate our findings in our draft report. We are also preparing a training / technology transfer session, as described in our proposal, in cooperation with RPI to provide NJDOT with basic concepts of safety analysis using case studies developed in this project. We are planning to offer this workshop in the next quarter.

3. List of deliverables provided in this quarter by task (product date):

1. Updated draft report on the case studies
2. Draft report of the review of existing strategies

Note: The above draft reports are incorporated into one single report that will be our final project report.

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

On May 5th 2007 we received the fully executed contract from NJDOT and we are still trying to finalize the sub- contracts to consultants, which will play an integral role in this project. Sub-contracts were sent to RPI in August 2007, which was later received back from RPI. On March 28th 2008, we received an approval of the no cost extension for the RPI subcontract from Rutgers until December 31st 2008.



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Our no cost extension (NCE) request until December 31st 2008 was approved. As part of this NCE request, we agreed to analyze all 8 NJ sites we were able to find as a result of our search for case studies.

Year 1 Budget	\$151,679
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$151,679
Modified Contract Amount:	
Total Project Expenditure to date	\$130,343
% of Total Project Budget Expended	85.9%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Stormwater System Monitoring and Evaluation		
RFP NUMBER: 2007-10	NJDOT RESEARCH PROJECT MANAGER: Edward Kondrath		
TASK ORDER NUMBER: TO 200 / RU Acct 4-28300	PRINCIPAL INVESTIGATOR: Dr. Qizhong (George) Guo		
Project Starting Date: 01/01/2007 Original Project Ending Date: 12/31/2008 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	1.61%	\$ 3,000	0.0%	\$ -	100.0%	\$ 3,000
2	Pre Literature Search	1.61%	\$ 3,000	0.0%	\$ -	100.0%	\$ 3,000
3	1. LITERATURE SEARCH	6.99%	\$ 13,000	0.0%	\$ -	100.0%	\$ 13,000
4	2. TECHNICAL PANEL	5.37%	\$ 10,000	0.0%	\$ -	100.0%	\$ 10,000
5	3. THREE REGIONS	8.60%	\$ 16,000	0.0%	\$ -	100.0%	\$ 16,000
6	4. REPRESENTATIVE DEVICES	5.37%	\$ 10,000	0.0%	\$ -	100.0%	\$ 10,000
7	5. PRE-MONITORING CLEAN-OUT	5.37%	\$ 10,000	5.0%	\$ 500	100.0%	\$ 10,000
8	6. MONITORING AND ANALYSIS	40.31%	\$ 75,000	10.0%	\$ 7,500	35.0%	\$ 26,250
9	7. MAINTENANCE GUIDANCE	6.99%	\$ 13,000	0.0%	\$ -	0.0%	\$ -
10	8. Final Report and Quarterly Reporting	17.78%	\$ 33,080	0.0%	\$ -	0.0%	\$ -
11		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
12		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
13		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
14		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
15		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
16		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
17		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
18		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
19		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
20		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
	TOTAL	100.00%	\$ 186,080		\$ 8,000		\$ 91,250

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Project Objectives:

1. Monitor the amounts of sediment, oil, grease, and buoyant debris that would be actually trapped in the stormwater treatment system units installed by NJDOT.
2. Relate the trapped amounts of sediment, oil, grease, and buoyant debris to highway drainage area characteristics.
3. Provide NJDOT with quantitative guidance on the maintenance/cleanup schedule and measures to reduce maintenance/cleanup frequency.

Project Abstract:

To improve the quality of highway runoff and meet the new stormwater management requirements, the New Jersey Department of Transportation (NJDOT) has installed numerous prefabricated stormwater treatment systems throughout the state produced by a range of manufacturers. The use of such systems, known as Manufactured Treatment Devices (MTDs), is expected to continue in the foreseeable future. As the responsible party for the maintenance of these MTDs, NJDOT is interested in determining optimum maintenance intervals and expected maintenance costs for the range of MTDs utilized by the Department. This project will monitor and document maintenance procedures, intervals, and costs for a representative range of MTDs.

1. Progress this quarter by task:

Task 5 (pre-monitoring cleanout) was completed. The scope of work was expanded to include data collection during the pre-monitoring cleanout, while the outside cleanout contractors were hired by NJDOT instead of the originally planned Rutgers. Samples of the cleanout sediments were collected and analyzed for chemical contents, in addition to the physical characteristics. Samples of the pump-out water were also collected and analyzed for chemical contents. A memorandum on the pre-monitoring cleanout was prepared and submitted.

Task 6 (monitoring and evaluation) was continued. The monitoring and evaluation was expanded to include the time period prior to the “pre-monitoring cleanout”. Observations about the sites including type and amount of gross solids on the ground, soil type, and land use type were continued. Design info such as drainage areas and constructions plans was continued to be collected. The newly cleaned sites have continued to be monitored including measurements of the sediment depth inside the treatment devices.

2. Proposed activities for next quarter by task:

Task 6 (monitoring and evaluation) will be continued. This monitoring and evaluation period is expected to last one full year.

3. List of deliverables provided in this quarter by task (product date):

A memorandum on the pre-monitoring cleanout, dated June 2008, was submitted.



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4. Progress on Implementation and Training Activities:

The NJDOT maintenance personnel were involved in the actual cleanout of the devices. . The NJDOT maintenance personnel as well as the contractors gained the valuable field maintenance experience.

Early observations on maintenance accessibility and interval were provided to NJDOT. The NJDOT was suggested to additionally consider device accessibility during design and construction despite other constraints, and to minimize the amount of gross solids entered the devices.

A device inspection form was made and provided to NJDOT Maintenance Division for their use.

Progress of the project and early observations were presented at the NJDOT Research Showcase on November 28, 2007.

5. Problems/Proposed Solutions:

Since the scope of work was expanded to include data collection during the pre-monitoring cleanout period, the last device was cleaned out in May 2008, and the monitoring and evaluation program would have to last a full year, a no-cost extension of the project to June 30, 2009 was requested.

Year 1 Budget	\$186,080
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$186,080
Modified Contract Amount:	\$186,080
Total Project Expenditure to date	\$91,250
% of Total Project Budget Expended	49.04%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Warm Asphalt Technology		
RFP NUMBER: 2008-01	NJDOT RESEARCH PROJECT MANAGER: Lad Szalaj		
TASK ORDER NUMBER: TO 218 / RU Acct 4-27212	PRINCIPAL INVESTIGATOR: Thomas Bennert		
Project Starting Date: 01/01/2008 Original Project Ending Date: 12/31/2009 Modified Completion Date:	Period Covered: 2 nd Quarter 2008		



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Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	10.52%	\$ 30,000	0.0%	\$ -	100.0%	\$ 30,000
2	Literature Search	2.88%	\$ 8,200	0.0%	\$ -	100.0%	\$ 8,200
3	Influence of Aggregate Blend Moisture Content	6.96%	\$ 19,840	5.0%	\$ 992	10.0%	\$ 1,984
4	Assessment of Compaction of Different WMA's	6.75%	\$ 19,238	5.0%	\$ 962	10.0%	\$ 1,924
5	Laboratory Sensitivity on the Gyratory Compaction of WMA's	13.11%	\$ 37,360	10.0%	\$ 3,736	10.0%	\$ 3,736
6	Laboratory Specimen Conditioning for Performance Testing	10.33%	\$ 29,436	5.0%	\$ 1,472	5.0%	\$ 1,472
7	Asphalt Binder Grade Selection	16.08%	\$ 45,835	5.0%	\$ 2,292	5.0%	\$ 2,292
8	Use of RAP	12.37%	\$ 35,250	5.0%	\$ 1,763	5.0%	\$ 1,763
9	In-Project Implementation - Field Trials	13.82%	\$ 39,390	5.0%	\$ 1,970	5.0%	\$ 1,970
10	Final Report and Quarterly Reporting	7.20%	\$ 20,522	0.0%	\$ -	0.0%	\$ -
11		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
12		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
13		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
14		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
15		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
16		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
17		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
18		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
19		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
20		0.00%	\$ -	0.0%	\$ -	0.0%	\$ -
	TOTAL	100.00%	\$ 285,071		\$ 13,185		\$ 53,339

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Project Objectives:

The objective of NJDOT 2008-01, *Warm Pavement Technology*, is to evaluate the different facets of warm mix asphalt production and performance for future use by the New Jersey Department of Transportation (NJDOT). An assessment of available warm mix additives/technologies will be conducted to provide NJDOT with preliminary recommendations for future use. The assessment will be based on Literature Reviews/Interviews, as well as a detailed laboratory and field research program detailed in this research proposal. This includes critical factors during the laboratory mixture design, as well as critical factors during the production and placement of warm mix asphalt. The research project will also evaluate the potential end uses of warm mix asphalt. This includes the typical use in



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structural pavements, as well as the potential use for pothole/maintenance mixes that could be used for long haul/long dwell time projects.

Project Abstract:

The research proposal is broken down into a Literature Search and nine major tasks. The research team will evaluate possible modifications to mixture design and analysis procedures for warm mix asphalt. This will be conducted through a literature search and interview process and then using laboratory experiments that address critical areas where hot and warm mix asphalt differ significantly. This includes limits to aggregate moisture, procedure for the selection of WMA and dosage rate, specimen fabrication, binder grade selection, and recycled asphalt materials (RAP). A sensitivity study to provide recommendations as to which WMA's are preferred, as well as to assess the affects of mixture volumetrics after compaction in the gyratory compactor will provide guidance to warm mix additive selection and expected issues with the Superpave volumetric design when using these additives. It is also proposed that a warm mix test trial, designed based on recommendations from the research study, be included as a validation/verification task. It is important to include the field study so a proper comparison can be verified between laboratory and field produced materials. An Implementation Plan at the conclusion of the study will provide a 1-Day Workshop regarding the use of Warm Mix Additives. The workshop will provide procedures and recommendations for warm mix additive selection, mixture design, and quality control procedures. The workshop will be conducted in the state of the art lecture hall facility at CAIT.

1. Progress this quarter by task:

Task 1 - Mobilization

Mobilization for the project has been completed.

Task 2 – Literature Review

The Feasibility/Literature Review was submitted to the NJDOT for view and comments. Also, based on the comments at the Kick-off meeting, Rutgers/CAIT is waiting for NJDOT to provide final approval to the workplan based on the finding of the Feasibility Study. As soon as approval has been given, work will begin on Tasks 3 and 4. The work involved with both tasks again shown below (same as the last QR) for review.

Task 3 – Influence of Aggregate Moisture Content

Aggregate sources are being identified that would conform to the proposed matrix provided in the proposal (Table 2 of the proposal, shown below). The main premise behind Task 2 would be to evaluate how the initial moisture content of the aggregates influence the moisture susceptibility (TSR). A preliminary procedure using the ignition oven to simulate the high burner temperatures of the Drum plant is being evaluated to potential use. Moisture would be added to the dry aggregate blend overnight in a plastic bag to ensure absorption. The blend would then be added to the steel mixing bowl and heated using an acetylene torch. Mixture temperature will be monitored using a heat gun



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and mixing will stop once the selected compaction temperature has been reached. TSR and Hamburg Wheel Tracking specimens would then be prepared and tested for moisture susceptibility and stripping potential.

Table 2 – Proposed Aggregate Blend Moisture Content Sensitivity Analysis

Target Aggregate Moisture Content	<u>Aggregate Blend Absorption Level</u>	
	Low (< 0.5%)	Moderate to High (>0.75%)
0%	X	X
3%	X	X
6%	X	X

Task 4 – Compactibility of Different WMA's

Based on the results of the “feasibility” study, WMA will be produced and compacted at different temperatures in the laboratory using the Marshall Compaction Hammer. Previous work at Rutgers has shown that this method correlated well to field results from the NJ Rt 38 Trial Project (figure below). Additional methods, such as the Torque Arm mixing bowl originally developed by NCAT, will also be evaluated with help from the University of Massachusetts at Dartmouth. Dr. Walaa Mogawer of U Mass has agreed to provide assistance with their new torque arm, workability device. At the present time, the three WMA additives that were identified in the Feasibility Report has been collected and proposed for evaluation. These include:

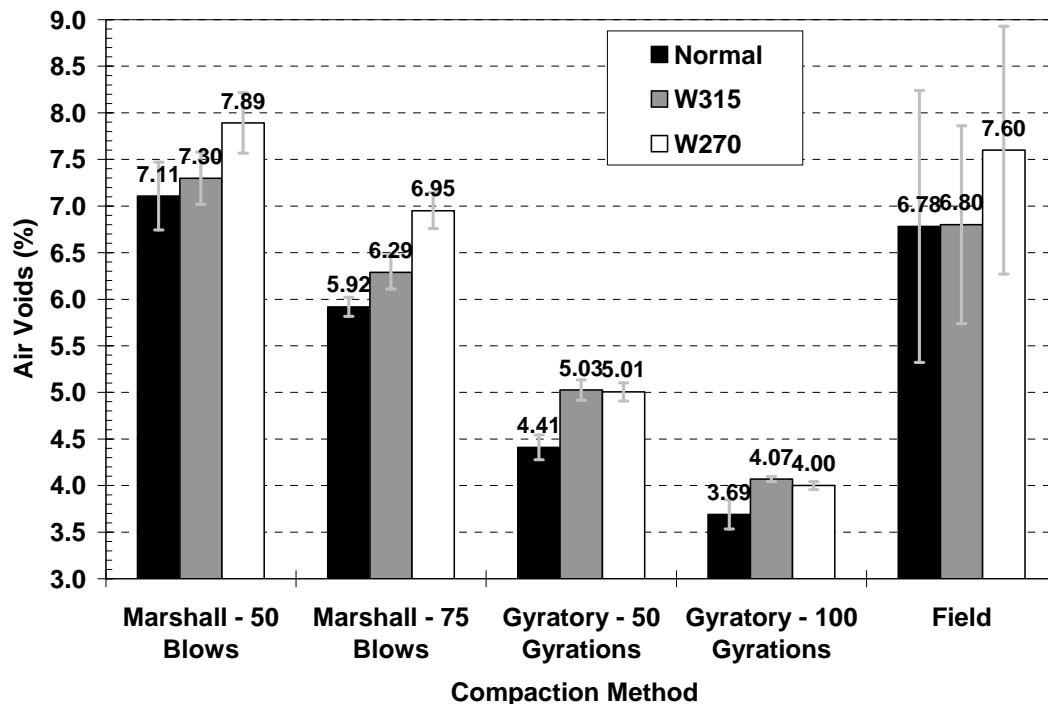
1. Sasobit
2. Advera
3. Rediset

Both the Sasobit and Rediset additives will be evaluated preblended to the asphalt binder and also added during the mixing process.



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Task 5 – Laboratory Specimen Preparation Procedure

Began mobilization for testing.

Task 6 – Asphalt Binder Selection

N.A.

Task 7 – Use of Higher RAP Percentages

N.A.

Task 8 – Field Trials

Rutgers/CAIT organized a small demonstration project using Sasobit preblended in a PG76-22 asphalt binder that was to be used in a 9.5mm SMA mixture placed on Rt 18 in New Brunswick, NJ. Rutgers/CAIT was on-site with NJDOT representatives to observe 2 nights of production and paving; normal production temperatures (340°F) and using the warm mix additive (280°F production temperatures). The loose mix produced appeared to be identical for both nights, with laboratory volumetrics and field densities measured with the nuclear density gauge being identical. Some compaction issues (slight mat pulling/tearing) was experienced on the night of the warm mix, but this



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was attributed to construction practices (paver speed was too fast and loose mix cooling in the paver due to lack of trucks supplying a constant feed of material to the paver). There was a visual reduction in the amount of emissions coming from the back of the trucks and at the paver with the use of the warm mix additive. Loose mix, compacted samples, and asphalt binder were sampled from both nights of production and will be evaluated in the laboratory.

2. Proposed activities for next quarter by task:

Task 3 and 4 will begin after authorization from the TWG.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Year 1 Budget	\$285,071.30
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$ 285,071.30
Modified Contract Amount:	
Total Project Expenditure to date	\$ 53,339
% of Total Project Budget Expended	18.7%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center (FHWA) 2008		
RFP NUMBER:		NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj	
TASK ORDER NUMBER: 223 / 4-23049		PRINCIPAL INVESTIGATOR: Dr. Ali Maher	
Project Starting Date: 01/01/2008 Original Project Ending Date: 12/31/2008		Period Covered: 2nd Quarter 2008	

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization		\$ -	0.00%	\$ -	0.00%	\$ -
2	Maintain Contact Lists	3.18%	\$ 6,828	25.00%	\$ 1,707	50.00%	\$ 3,414
3	Publish Newsletter	8.74%	\$ 18,791	25.00%	\$ 4,698	50.00%	\$ 9,396
4	Distribute Technology Transfer Materials	3.75%	\$ 8,064	35.00%	\$ 2,822	60.00%	\$ 4,838
5	Provide Information Service	16.00%	\$ 34,414	25.00%	\$ 8,604	50.00%	\$ 17,207
6	Provide Training Courses	53.45%	\$ 114,918	30.00%	\$ 34,475	65.00%	\$ 74,697
7	Evaluate Effectiveness of Program	5.81%	\$ 12,481	25.00%	\$ 3,120	50.00%	\$ 6,241
8	Special Projects	9.07%	\$ 19,504	25.00%	\$ 4,876	50.00%	\$ 9,752
9		0.00%		0.00%	\$ -	0.00%	\$ -
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 215,000		\$ 60,302		\$ 125,545

Blue text is entered once at the beginning of the project

Green text is updated ever quarter

Black text is automatically updated or static

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Project Objectives:

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The objectives of this project are to continue to diversify and expand the customer base, deliver quality customer service, communicate the program values to partners and clients, and enhance the technology transfer network, through the activities of the New Jersey Local Technical Assistance Program (LTAP).

Project Abstract:

The New Jersey Local Technical Assistance Program (LTAP) will continue to maintain mailing lists, publish a monthly newsletter, provide technical assistance, provide training, and evaluate the effectiveness of the program on an ongoing basis throughout the project.

The technology transfer services of LTAP have been expanded to support the transportation industry through the promotion of best practices, new research, products, and proven technologies that are applicable to New Jersey roadways.

Center Name: New Jersey LTAP
Reporting Period: April 1, 2008 to June 30, 2008

Program Dashboard

Total number of training sessions:	<u>55</u>
Total number of participants:	<u>1,668</u>
Total number of participant hours:	<u>6,791.5</u>
Total newsletter circulation:	<u>11,397</u>
Total number of LTAP/TTAP FTEs:	<u>2.5</u>



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Training Data

Safety

The Safety metric is divided into 2 categories: Highway Safety and Worker/Workplace Safety. Count the training your center conducted or had responsibility for conducting, such as training co-sponsored with a partner.

Worker/Workplace Safety

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Worker and Equipment Safety	2.5	1	8					8	20
Personal Injury Prevention Techniques	2.5	1	7					7	21
Hazards Associated w/Fertilizers, Insecticides, Herbicides	2.5	1	6					6	15
Correct & Safe Way to Roadside Mow	3	1	11					11	33
Confined Space and Excavation Rescue	2.5	1	11					11	27.5
Excavation and Trenching Safety	2.5	1	11					11	27.5
Grounds Maintenance Safety	2.5	1	7					7	17.5
TOTAL	18	7	61					61	161.5



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Highway Safety

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Work Zone Safety Awareness Program	6	3	31		1	1	66	99	594
Traffic Control Coordinator Program	32	2	3		1	1	44	49	1,568
An Overview of Statewide Safety Enhancement Focus Areas	1.5	1	6		10		49	75	112.5
Traffic Control Coordinator Refresher	4	3	10		100		155	265	660
NJ Safety Efforts: Plan4Safety	1	1			9		41	50	50
Work Zone Safety Conference	6.5	1						233	1,514.5
Traffic Simulation Olympics	2	1			9		41	50	50
Review of MUTCD Changes for 2009	1.5	1					35	35	52.5
New Tricks for Old Signals	1.5	1					35	35	52.5
Traffic Safety Initiatives	1.5	1					35	35	52.5
Improving Pedestrian Safety	1.5	1					35	35	52.5
Human Factors	1.5	1					35	35	52.5
TOTAL	60.5	18	50		121	2	530	946	4,811.5



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Infrastructure Management

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
NJDEP Stormwater Management Program and Compliance	2.5	1	30					30	75
Bridge Maintenance for Locals	7.5	1	30		11		3	44	330
Stormwater Issues and Answers for Public Works	3	1	12				1	13	39
Porous Pavement and Stormwater Seminar	3	2	12		3		51	66	198
Asphalt Roads: Common Maintenance Problems	2.5	1	8					8	20
Drainage Maintenance; The Key To Roads That Last	2.5	1	8					8	20
Pavement Management Systems for Municipal/County Road Departments	3	1	6				3	9	27
Hot Mix Asphalt Resurfacing	2.5	1	10					10	25
Low Cost Surface Rehabilitation	2.5	1	12					12	30
Concrete Pavements Maintenance and Repair	3	1	13					13	39
Alternative Fuels Transportation Infrastructure Initiative	6	1			5		25	30	180
Land Use and Zoning	1.5	1					35	35	52.5
Atlantic City Redevelopment	1.5	1					35	35	52.5
Next Generation in Transit Fleets	1.5	1					35	35	52.5
Context Sensitive Solutions	1.5	1					35	35	52.5
Innovative Designs	1.5	1					35	35	52.5
ITS Deployment	1.5	1					35	35	52.5
TOTAL	47	20	143		19		293	453	1,298

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Workforce Development

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Public Relations: Managing the Public Response	3	1	7					7	21
Successful Budgeting for Public Works	3	1	4					4	12
Shared Services and Privatization	3	1	10					10	30
Managing Public Equipment	3	1	10					10	30
Effective Incident Documentation	2.5	1	12					12	30
Public Works Ethics Update	2	1	30					30	60
Ethics for Public Works Employees	6	1	30					30	180
Improving Survey Techniques	1.5	1					35	35	52.5
Standards and Regulations	1.5	1					35	35	52.5
Improving our Analysis Techniques	1.5	1					35	35	52.5
TOTAL	27	10	73				105	208	520.5

Newsletter / Published Resources Data

Circulation

Name of Newsletter	Circulation				
	Local	Tribal	State	Federal	Other
Just the CAIT LTAP FAX	1,981	8	920	161	729



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Number of Articles per Focus Area

Newsletter Issue	Safety			Workforce Development	Infrastructure Management
	Highway	Worker	Work Zone		
Volume 10, Number 4	1	1	1	1	3
Volume 10, Number 5	1	1	1	2	2
Volume 10, Number 6	1	1	1	2	2

Materials Distribution Data

Material Types	Safety			Workforce Development	Infrastructure Management
	Highway	Worker	Work Zone		
Publications	1,440	289	1,500	108	325
CDs					
Videotapes					
DVDs					
Downloads					
Others [insert]					
TOTAL:	1,440	289	1,500	108	325

Technical Assistance Data

Estimate the total percentage of time spent by your Center staff providing technical assistance during the past quarter: **30%**



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Activities Related to Program Stakeholders

Organization	Activities					
	# of times center distributed information for this organization (mail, e-mail, fax, etc.)	# of joint training sessions	# of joint conferences	# of joint special programs	# of articles reprinted in LTAP/TTAP newsletters from this organization	# of center staff participating in national program efforts
National Stakeholders						
FHWA (HQ, Resource Center)	3				3	2
AASHTO					1	
NACE					1	
APWA	3				4	2
TRB					1	1
Salt Institute						
State/Local Stakeholders						
FHWA Division						2
State DOT/govt				1		3
AASHTO Chapter						
NACE Chapter						1
APWA Chapter	5	1				2
ITE	2	18				2
Other Stakeholders						
NJ Society of Municipal Engineers	1			1		
NJ Div of Highway Traffic Safety	5	8	1	2		2
NJ Asphalt Pavement Assoc.	1	2				1
NJ WZS Partnership	2		1	2		2

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Page 8 of 14



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1. Progress this quarter by task, with specific deliverables:

A. Maintain Contact Lists

- The contact list database was updated to current New Jersey Mayors.

Revisions/Deletions
Mayors Emails

Ongoing
May 2008

B. Publish Newsletter

- 3,799 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail.

Volume 10, Number 4
Volume 10, Number 5
Volume 10, Number 6

April 2008
May 2008
June 2008

C. Distribute Technology Transfer Materials

- 3,662 technical materials were distributed this quarter.

NJDOT Work Zone Safety Setup Guide
New MUTCD Retro-reflectivity Requirements

April-June 2008
April-June 2008

D. Provide an Information Service

Technical Assistance
NJAPA Conference Planning Meeting
TRANSACTION Conference Presentation
Work Zone Safety Press Conference
LTAP Region One Meeting
NJ Work Zone Safety Conference

Ongoing
April 1, 2008
April 2, 2008
April 7, 2008
April 8-9, 2008
April 10, 2008



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NLTAPA Executive Committee Meeting	April 14, 2008
APWA Executive Board Meeting	April 16, 2008
ITE Metropolitan Section Meeting	April 17, 2008
NJ NACE Meeting	April 18, 2008
NJDOT Research Showcase Meeting	April 18, 2008
NJ Safety Council Awards	April 22, 2008
NJ Public Works Expo	April 22, 2008
NJDOT Annual TRB Site Visit	April 28, 2008
APWA NJ Executive Committee	May 14, 2008
NJ Work Zone Safety Partnership Meeting	May 15, 2008
NLTAPA Roundtable Discussion	May 22, 2008
UTC Workforce Summit	May 28, 2008
NJ Society of Municipal Engineers	June 4, 2008
NLTAPA Executive Committee Meeting	June 9, 2008
APWA NJ Executive Committee	June 18, 2008
Society of Asphalt Technologists	June 18, 2008
NJ Work Zone Safety Partnership Meeting	June 19, 2008
NJ LTAP Stakeholder Meeting	June 20, 2008
APWA Public Works Institute Meeting	June 23, 2008
RSA Peer Group Network Meeting	June 27, 2008

E. Training

Bridge Maintenance for Locals	April 1, 2008
Concrete Pavements Maintenance and Repair	April 3, 2008
Stormwater Issues & Answers for Public Works	April 7, 2008
Work Zone Safety Awareness Program	April 8, 2008
Work Zone Safety Conference	April 10, 2008
Traffic Control Coordinator Refresher Program	April 11, 2008
Public Relations: Managing the Public Response	April 14, 2008
Hazards Associated w/Fertilizers, Insecticides, Herbicides	April 15, 2008
Grounds Maintenance Safety	April 15, 2008
Porous Pavement and Stormwater Management	April 16, 2008
Porous Pavement and Stormwater Management	April 16, 2008
NJ Safety Efforts- Plan4Safety	April 17, 2008
Traffic Simulation Olympic	April 17, 2008
An Overview of Statewide Safety Enhancement Focus Areas	April 17, 2008
Pavement Management Systems for Municipal/County	April 17, 2008
Traffic Control Coordinator	April 22-25, 2008
The Safe and Correct Way to Roadside Mow	April 23, 2008
Successful Budgeting for Public Works	May 5, 2008
Drainage Maintenance: The Key to Roads that Last	May 6, 2008
Asphalt Roads: Common Maintenance Problems	May 6, 2008



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Traffic Control Coordinator Refresher Program	May 9, 2008
Worker and Equipment Safety	May 14, 2008
Personal Injury Prevention Techniques	May 14, 2008
Work Zone Safety Awareness Program	May 15, 2008
Confined Space and Excavation Rescue	May 21, 2008
Excavation and Trenching Safety	May 21, 2008
Shared Services and Privatization	May 28, 2008
Managing Public Equipment	May 28, 2008
Land Use and Zoning	May 28, 2008
Improving Survey Techniques	May 28, 2008
Traffic Safety Initiatives	May 29, 2008
Context Sensitive Solutions	May 29, 2008
Improving Pedestrian Safety	May 29, 2008
Using Traffic Safety Data	May 29, 2008
Atlantic City Redevelopment	May 29, 2008
Innovative Designs	May 29, 2008
Standards and Regulations	May 29, 2008
ITS Deployment	May 29, 2008
Multi-Modal Initiatives	May 29, 2008
NJDEP Stormwater Management Program and Compliance	May 29, 2008
Human Factors	May 30, 2008
New Tricks for Old Signals	May 30, 2008
Improving Our Analysis Techniques	May 30, 2008
Next Generation in Transit Fleets	May 30, 2008
Traffic Control Coordinator Refresher	May 30, 2008
Traffic Control Coordinator	June 3-6, 2008
Alternative Fuels Transportation Infrastructure Initiative	June 4, 2008
Effective Incident Documentation	June 4, 2008
Ethics for Public Works Employees	June 9, 2008
Work Zone Safety Awareness Program	June 10, 2008
Hot Mix Asphalt Resurfacing	June 19, 2008
Low Cost Surface Rehabilitation	June 19, 2008
Public Works Ethics Update	June 19, 2008

F. Evaluate the Effectiveness of the Program

Course Evaluations	Ongoing
Stakeholder Meeting	June 20, 2008
April – June 2008 Quarterly Report	June 2008

G. Special Projects



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2006 Implementation Study Report
Interviews with NJDOT Research Customers
Draft of 2004 and 2005 Implementation Study

April 2008
May-June 2008
June 2008

2. Proposed activities for next quarter by task:

A. Maintain Contact Lists

- The mail list will be continually be updated on an as needed basis.

B. Publish Newsletter

- The NJ LTAP newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

- Technology transfer materials will be distributed during training programs, and by request. The lending library is always available.

D. Provide Information Service

- Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.
- NJ LTAP staff will attend the National LTAP Meeting July 14-17 in Colorado.
- NJLTAP staff will coordinate the 2008 National Summer Transportation Institute at the Garret Morgan Academy.
- NJ LTAP staff will attend the Annual APWA Congress.
- NJ LTAP staff will continue to serve as Representative of Region One to the National LTAP Association, as Chair of the Association's Internal Communications Workgroup, and on the NLTAPA Clearinghouse Committee.
- NJ LTAP staff will continue to serve on various committees of professional organizations.



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E. Provide Training Courses

- Training programs are scheduled for the next quarter in the following areas:

Traffic Control Coordinator Program
Work Zone Safety Awareness Program
Road Scholar One Program

Road Scholar Two Program
Traffic Engineering
Transportation/Infrastructure Seminars

F. Evaluate Effectiveness of Program

- Evaluations will continue to be distributed at each program.
- A Stakeholder Committee meeting will be held in September 2008.
- A Steering Committee meeting will be held every other month and/or on an as-needed basis to review program activities and initiatives, as well as to set long-term goals.

G. Special Projects

- Final Report of 2004 and 2005 Implementation Study results

4. Progress on Implementation and Training Activities:

All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:



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Year 1 Budget	\$215,000
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$215,000
Modified Contract Amount:	\$
Total Project Expenditure to date	\$125,545
% of Total Project Budget Expended	58.39%

NJDOT Research Project Manager Concurrence: _____ Date: _____



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QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center (STATE) 2008		
RFP NUMBER:		NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj	
TASK ORDER NUMBER: TO 223 4-20725		PRINCIPAL INVESTIGATOR: Dr. Ali Maher	
Project Starting Date: 01/01/2008 Original Project Ending Date: 12/31/2008 Modified Completion Date:		Period Covered: 2nd Quarter 2008	

Task #	Task	% of Total	Fixed Budget	% of Task this quarter	Cost this quarter	% of Task to date	Total cost to date
1	Mobilization	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
2	Literature Search	0.00%		0.00%	\$ -	0.00%	\$ -
3	Maintain Contact Lists	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
4	Publish Newsletter	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
5	Distribute Technology Transfer Materials	0.84%	\$ 504	0.00%	\$ -	0.00%	\$ -
6	Provide Information Service	31.77%	\$ 19,062	25.00%	\$ 4,766	50.00%	\$ 9,531
7	Provide Training Courses	33.04%	\$ 19,827	25.00%	\$ 4,957	50.00%	\$ 9,914
8	Evaluate the Effectiveness of Program	1.19%	\$ 712	25.00%	\$ 178	50.00%	\$ 356
9	Special Projects	33.16%	\$ 19,895	40.00%	\$ 7,958	80.00%	\$ 15,916
10		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
11		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
12		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
13		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
14		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
15		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
16		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
17		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
18		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
19		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
20		0.00%	\$ -	0.00%	\$ -	0.00%	\$ -
	TOTAL	100.00%	\$ 60,000		\$ 17,859		\$ 35,717

Blue text is entered once at the beginning of the project

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Training Data

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Worker/Workplace Safety

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Worker and Equipment Safety	2.5	1	8					8	20
Personal Injury Prevention Techniques	2.5	1	7					7	21
Hazards Associated w/Fertilizers, Insecticides, Herbicides	2.5	1	6					6	15
Correct & Safe Way to Roadside Mow	3	1	11					11	33
Confined Space and Excavation Rescue	2.5	1	11					11	27.5
Excavation and Trenching Safety	2.5	1	11					11	27.5
Grounds Maintenance Safety	2.5	1	7					7	17.5
TOTAL	18	7	61					61	161.5



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Highway Safety

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Work Zone Safety Awareness Program	6	3	31		1	1	66	99	594
Traffic Control Coordinator Program	32	2	3		1	1	44	49	1,568
An Overview of Statewide Safety Enhancement Focus Areas	1.5	1	6		10		49	75	112.5
Traffic Control Coordinator Refresher	4	3	10		100		155	265	660
NJ Safety Efforts: Plan4Safety	1	1			9		41	50	50
Work Zone Safety Conference	6.5	1						233	1,514.5
Traffic Simulation Olympics	2	1			9		41	50	50
Review of MUTCD Changes for 2009	1.5	1					35	35	52.5
New Tricks for Old Signals	1.5	1					35	35	52.5
Traffic Safety Initiatives	1.5	1					35	35	52.5
Improving Pedestrian Safety	1.5	1					35	35	52.5
Human Factors	1.5	1					35	35	52.5
TOTAL	60.5	18	50		121	2	530	946	4,811.5



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Infrastructure Management

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
NJDEP Stormwater Management Program and Compliance	2.5	1	30					30	75
Bridge Maintenance for Locals	7.5	1	30		11		3	44	330
Stormwater Issues and Answers for Public Works	3	1	12				1	13	39
Porous Pavement and Stormwater Seminar	3	2	12		3		51	66	198
Asphalt Roads: Common Maintenance Problems	2.5	1	8					8	20
Drainage Maintenance; The Key To Roads That Last	2.5	1	8					8	20
Pavement Management Systems for Municipal/County Road Departments	3	1	6				3	9	27
Hot Mix Asphalt Resurfacing	2.5	1	10					10	25
Low Cost Surface Rehabilitation	2.5	1	12					12	30
Concrete Pavements Maintenance and Repair	3	1	13					13	39
Alternative Fuels Transportation Infrastructure Initiative	6	1			5		25	30	180
Land Use and Zoning	1.5	1					35	35	52.5
Atlantic City Redevelopment	1.5	1					35	35	52.5
Next Generation in Transit Fleets	1.5	1					35	35	52.5
Context Sensitive Solutions	1.5	1					35	35	52.5
Innovative Designs	1.5	1					35	35	52.5
ITS Deployment	1.5	1					35	35	52.5
TOTAL	47	20	143		19		293	453	1,298

100 BRETT RD. PISCATAWAY NJ 08854-8058

TEL: 732-445-0579 FAX: 732-445-3325



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Workforce Development

Session Name	Session Length [hours]	Total # of Sessions	Total # of participants					Total # of Participants	Total Participant Hours
			Local	Tribal	State	Federal	Other		
Public Relations: Managing the Public Response	3	1	7					7	21
Successful Budgeting for Public Works	3	1	4					4	12
Shared Services and Privatization	3	1	10					10	30
Managing Public Equipment	3	1	10					10	30
Effective Incident Documentation	2.5	1	12					12	30
Public Works Ethics Update	2	1	30					30	60
Ethics for Public Works Employees	6	1	30					30	180
Improving Survey Techniques	1.5	1					35	35	52.5
Standards and Regulations	1.5	1					35	35	52.5
Improving our Analysis Techniques	1.5	1					35	35	52.5
TOTAL	27	10	73				105	208	520.5

Newsletter / Published Resources Data

Circulation

Name of Newsletter	Circulation				
	Local	Tribal	State	Federal	Other
Just the CAIT LTAP FAX	1,981	8	920	161	729



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Number of Articles per Focus Area

Newsletter Issue	Safety			Workforce Development	Infrastructure Management
	Highway	Worker	Work Zone		
Volume 10, Number 4	1	1	1	1	3
Volume 10, Number 5	1	1	1	2	2
Volume 10, Number 6	1	1	1	2	2

Materials Distribution Data

Material Types	Safety			Workforce Development	Infrastructure Management
	Highway	Worker	Work Zone		
Publications	1,440	289	1,500	108	325
CDs					
Videotapes					
DVDs					
Downloads					
Others [insert]					
TOTAL:	1,440	289	1,500	108	325

Technical Assistance Data

Estimate the total percentage of time spent by your Center staff providing technical assistance during the past quarter: **30%**



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Activities Related to Program Stakeholders

Organization	Activities					
	# of times center distributed information for this organization (mail, e-mail, fax, etc.)	# of joint training sessions	# of joint conferences	# of joint special programs	# of articles reprinted in LTAP/TTAP newsletters from this organization	# of center staff participating in national program efforts
National Stakeholders						
FHWA (HQ, Resource Center)	3				3	2
AASHTO					1	
NACE					1	
APWA	3				4	2
TRB					1	1
Salt Institute						
State/Local Stakeholders						
FHWA Division						2
State DOT/govt				1		3
AASHTO Chapter						
NACE Chapter						1
APWA Chapter	5	1				2
ITE	2	18				2
Other Stakeholders						
NJ Society of Municipal Engineers	1			1		
NJ Div of Highway Traffic Safety	5	8	1	2		2
NJ Asphalt Pavement Assoc.	1	2				1
NJ WZS Partnership	2		1	2		2



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1. Progress this quarter by task, with specific deliverables:

A. Maintain Contact Lists

- The contact list database was updated to current New Jersey Mayors.

Revisions/Deletions
Mayors Emails

Ongoing
May 2008

B. Publish Newsletter

- 3,799 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail.

Volume 10, Number 4
Volume 10, Number 5
Volume 10, Number 6

April 2008
May 2008
June 2008

C. Distribute Technology Transfer Materials

- 3,662 technical materials were distributed this quarter.

NJDOT Work Zone Safety Setup Guide
New MUTCD Retro-reflectivity Requirements

April-June 2008
April-June 2008

D. Provide an Information Service

Technical Assistance
NJAPA Conference Planning Meeting
TRANSACTION Conference Presentation
Work Zone Safety Press Conference
LTAP Region One Meeting
NJ Work Zone Safety Conference
NLTAPA Executive Committee Meeting
APWA Executive Board Meeting
ITE Metropolitan Section Meeting
NJ NACE Meeting
NJDOT Research Showcase Meeting
NJ Safety Council Awards

Ongoing
April 1, 2008
April 2, 2008
April 7, 2008
April 8-9, 2008
April 10, 2008
April 14, 2008
April 16, 2008
April 17, 2008
April 18, 2008
April 18, 2008
April 22, 2008



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NJ Public Works Expo	April 22, 2008
NJDOT Annual TRB Site Visit	April 28, 2008
APWA NJ Executive Committee	May 14, 2008
NJ Work Zone Safety Partnership Meeting	May 15, 2008
NLTAPA Roundtable Discussion	May 22, 2008
UTC Workforce Summit	May 28, 2008
NJ Society of Municipal Engineers	June 4, 2008
NLTAPA Executive Committee Meeting	June 9, 2008
APWA NJ Executive Committee	June 18, 2008
Society of Asphalt Technologists	June 18, 2008
NJ Work Zone Safety Partnership Meeting	June 19, 2008
NJ LTAP Stakeholder Meeting	June 20, 2008
APWA Public Works Institute Meeting	June 23, 2008
RSA Peer Group Network Meeting	June 27, 2008

E. Training

Bridge Maintenance for Locals	April 1, 2008
Concrete Pavements Maintenance and Repair	April 3, 2008
Stormwater Issues & Answers for Public Works	April 7, 2008
Work Zone Safety Awareness Program	April 8, 2008
Work Zone Safety Conference	April 10, 2008
Traffic Control Coordinator Refresher Program	April 11, 2008
Public Relations: Managing the Public Response	April 14, 2008
Hazards Associated w/Fertilizers, Insecticides, Herbicides	April 15, 2008
Grounds Maintenance Safety	April 15, 2008
Porous Pavement and Stormwater Management	April 16, 2008
Porous Pavement and Stormwater Management	April 16, 2008
NJ Safety Efforts- Plan4Safety	April 17, 2008
Traffic Simulation Olympic	April 17, 2008
An Overview of Statewide Safety Enhancement Focus Areas	April 17, 2008
Pavement Management Systems for Municipal/County	April 17, 2008
Traffic Control Coordinator	April 22-25, 2008
The Safe and Correct Way to Roadside Mow	April 23, 2008
Successful Budgeting for Public Works	May 5, 2008
Drainage Maintenance: The Key to Roads that Last	May 6, 2008
Asphalt Roads: Common Maintenance Problems	May 6, 2008
Traffic Control Coordinator Refresher Program	May 9, 2008
Worker and Equipment Safety	May 14, 2008
Personal Injury Prevention Techniques	May 14, 2008
Work Zone Safety Awareness Program	May 15, 2008
Confined Space and Excavation Rescue	May 21, 2008
Excavation and Trenching Safety	May 21, 2008
Shared Services and Privatization	May 28, 2008



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Managing Public Equipment	May 28, 2008
Land Use and Zoning	May 28, 2008
Improving Survey Techniques	May 28, 2008
Traffic Safety Initiatives	May 29, 2008
Context Sensitive Solutions	May 29, 2008
Improving Pedestrian Safety	May 29, 2008
Using Traffic Safety Data	May 29, 2008
Atlantic City Redevelopment	May 29, 2008
Innovative Designs	May 29, 2008
Standards and Regulations	May 29, 2008
ITS Deployment	May 29, 2008
Multi-Modal Initiatives	May 29, 2008
NJDEP Stormwater Management Program and Compliance	May, 29, 2008
Human Factors	May 30, 2008
New Tricks for Old Signals	May 30, 2008
Improving Our Analysis Techniques	May 30, 2008
Next Generation in Transit Fleets	May 30, 2008
Traffic Control Coordinator Refresher	May 30, 2008
Traffic Control Coordinator	June 3-6, 2008
Alternative Fuels Transportation Infrastructure Initiative	June 4, 2008
Effective Incident Documentation	June 4, 2008
Ethics for Public Works Employees	June 9, 2008
Work Zone Safety Awareness Program	June 10, 2008
Hot Mix Asphalt Resurfacing	June 19, 2008
Low Cost Surface Rehabilitation	June 19, 2008
Public Works Ethics Update	June 19, 2008

F. Evaluate the Effectiveness of the Program

Course Evaluations	Ongoing
Stakeholder Meeting	June 20, 2008
April – June 2008 Quarterly Report	June 2008

G. Special Projects

2006 Implementation Study Report	April 2008
Interviews with NJDOT Research Customers	May-June 2008
Draft of 2004 and 2005 Implementation Study	June 2008



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2. Proposed activities for next quarter by task:

A. Maintain Contact Lists

- The mail list will be continually be updated on an as needed basis.

B. Publish Newsletter

- The NJ LTAP newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

- Technology transfer materials will be distributed during training programs, and by request. The lending library is always available.

D. Provide Information Service

- Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.
- NJ LTAP staff will attend the National LTAP Meeting July 14-17 in Colorado.
- NJLTAP staff will coordinate the 2008 National Summer Transportation Institute at the Garret Morgan Academy.
- NJ LTAP staff will attend the Annual APWA Congress.
- NJ LTAP staff will continue to serve as Representative of Region One to the National LTAP Association, as Chair of the Association's Internal Communications Workgroup, and on the NLTAPA Clearinghouse Committee.
- NJ LTAP staff will continue to serve on various committees of professional organizations.

E. Provide Training Courses

- Training programs are scheduled for the next quarter in the following areas:

Traffic Control Coordinator Program
Work Zone Safety Awareness Program
Road Scholar One Program
Road Scholar Two Program



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Traffic Engineering
Transportation/Infrastructure Seminars

F. Evaluate Effectiveness of Program

- Evaluations will continue to be distributed at each program.
- A Stakeholder Committee meeting will be held in September 2008.
- A Steering Committee meeting will be held every other month and/or on an as-needed basis to review program activities and initiatives, as well as to set long-term goals.

G. Special Projects

- Final Report of 2004 and 2005 Implementation Study results

4. Progress on Implementation and Training Activities:

All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:

Year 1 Budget	\$60,000
Years 1 & 2 Cumulative Budget	
Years 1, 2 & 3 Cumulative Budget	
Total Project Budget	\$60,000
Modified Contract Amount:	\$
Total Project Expenditure to date	\$35,717
% of Total Project Budget Expended	59.53%

NJDOT Research Project Manager Concurrence: _____ Date: _____